

# **Review of 3.0 Methodology**

## *Summary of Key Findings and Recommendations*

*presented to*

**NC Joint Transportation Appropriations Committee**

*presented by*

**Cambridge Systematics, Inc.**

**Joe Guerre**

*March 5, 2015*

**ECONOMETRICA, INC.**

**CAMBRIDGE**  
SYSTEMATICS

# Approach

**Statistical  
Track**

**Transportation  
Track**



**Recommended  
Enhancements**

# Overall Themes

- ◎ Very mature process that represents significant time and numerous best practices
- ◎ From outside perspective, we've identified some inconsistencies and relatively easy options to address them
  - » Mathematical inconsistencies
  - » Terminology inconsistencies
- ◎ Significant biases by project type don't appear to be an issue

# Recommendations within and Across Modes



# Biggest Statistical Issues Across Modes

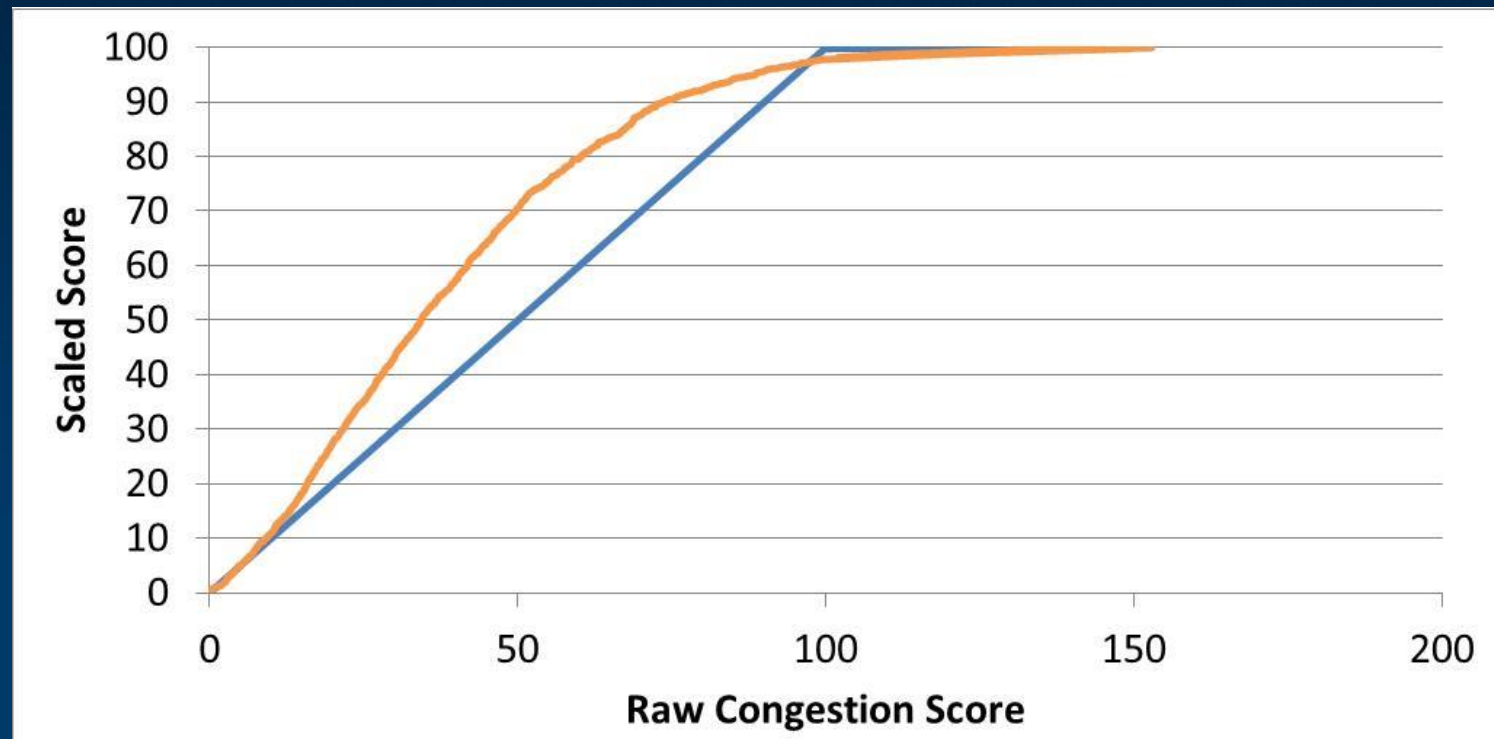
- ◎ Low ranges and disproportional weighting

Disproportionate Impact of Criteria on Quantitative Scores Statewide Rail Projects							
Statistic	Benefit Cost	Economic	Capacity Congestion	Safety	Accessibility	Connectivity	Mobility
Weight	20%	10%	15%	15%	10%	10%	20%
Percent of Score Accounted for by Criteria	5%	2%	9%	18%	3%	8%	54%

- ◎ Global recommendation - scale all criteria from 0-100  
*consistently*

# Recommendation – Grade all Projects on a Curve

## Example – Highway Congestion



— P3.0 — Recommended scaling based on relative distribution



# Implications of Grading on a Curve

- ◎ It will be possible for a project to get a total score of 100
- ◎ There will be a mixture of low, medium and high scoring projects
- ◎ Results will more closely reflect the weights assigned to each criterion
- ◎ Consistent scaling will help with prioritization within modes and prioritization across modes

# Other Global Recommendations

- ◎ Improve consistency of terms between modes
- ◎ When possible, evaluate projects based on *expected benefit* rather than *current conditions*
- ◎ Calculate cost-effectiveness when benefit-cost is not possible

$$\text{Cost} - \text{Effectiveness} = \frac{\text{non} - \text{monitized benifits}}{\text{project cost}}$$

- ◎ Introduce a new Financial Leverage criterion

$$\text{Financial Leverage} = \frac{\text{non} - \text{NCDOT project costs}}{\text{NCDOT project costs}}$$



# Other Global Recommendations

It's not mathematically possible to definitively quantify the differences between apples and oranges.  
But we make these types of decisions every day.



## ◎ Cross-modal recommendations

- » Continue to use mode-specific criteria rather than criteria that are applicable across modes
- » Ensure transparency when evaluating priorities across modes

# Highway Recommendations



# Highway Recommendations

- H.1 Improve travel time calculation
- H.2 Update the values of time used in B/C
- H.3 Include additional benefits in B/C
- H.4 Rename B/C to “Leveraged B/C” and revise calculation
- H.5 Use seasonal traffic volumes for Congestion and B/C
- H.6 Improve Congestion calculation to capture project impacts
- H.7 Improve Safety calculation to capture project impacts
- H.8 Define objective of connectivity/accessibility